

# **Economic Recovery of post COVID-19 towards Kuala Lumpur Composite Index (KLCI) and Malaysian Ringgit Exchange Rate**

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## **Abstract:**

The aim of this paper is to analyze economic recovery status for post outbreak of Coronavirus disease (COVID-19) towards equity market namely Kuala Lumpur Composite Index (KLCI) and currency exchange rate for Malaysian Ringgit. The COVID-19 is a pandemic that considered as an infectious disease caused by a newly discovered coronavirus in year of 2019. This pandemic affected worldwide population including Asian region. Therefore, it is important to analyze the significant effect of post COVID-19 towards economy including stock market and currency exchange rate. This study implemented correlation analysis between changes of KLSI and MYR currency exchange rate. There is positive correlation between KLCI and Ringgit exchange rate. Both of these variables indicate Malaysia is recovering with positive environment for economic situation. The findings of this study will provide knowledge to body of literature including give positive feedback to investors to have confidence in Malaysia economic situation after COVID-19 lockdown.

**Keywords:** Coronavirus disease (COVID-19), Correlation, KLCI, Malaysian Ringgit Currency, Economic condition.

## **1. Introduction**

Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus. The symptom of COVID-19 are fever or chills, cough, shortness of breath or difficulty breathing, fatigue, headache and others symptoms. Therefore, the person who are involved in these symptoms are encourage to self-quarantine and always avoid go to the crowded place, maintain at least 1-meter distances from other and avoid close-contact with others people.

The COVID-19 is affecting 213 countries and territories around the world and 2 international conveyances (World Health Organization, 2020). Malaysia is one of the countries affected by COVID-19. In Malaysia, the first of COVID-19 disease was detected in early 2020. Therefore, government of Malaysia was performing a lockdown approach for movement control order (MCO) in 18 Mac 2020. The main objective of MCO is to reduce the spread of COVID-19 virus among Malaysian citizen. During the MCO, people are required to stay at home, with only those who work in essential industries (e.g. health care, food, public transportation and utilities) allowed to work on site. While employees whose jobs could not be conducted from home (e.g. factory workers, retail workers) were out of work, employees whose work could be conducted from home (e.g. most professionals) were asked to continue working from home. Work from home allows work to seep into home life, it blurs the boundary between work and family, thus increasing work-family interference (Feng and Savani, 2020; Noonan and Glass, 2012).

Lockdown approach gives a big impact on the industries in Malaysia especially on finance sectors. This is because government of Malaysia was implement Financial Relief Scheme, that have granted 6-month moratorium to all customers. Moratorium will end on 30 September 2020 and all loan repayment will resume in October 2020. Besides that, on 27<sup>th</sup> March 2020, Government of Malaysia was announced Prihatin Rakyat Economic Stimulus Package 2020 (PRIHATIN Package) worth RM250 billion (Povera, 2020). The aims of PRIHATIN Package to protect the welfare of the people and to support businesses including Small and Medium Enterprises as well as strengthen the country's economy to weather the effects of the COVID-19 pandemic.

Therefore, this study was investigating the economic recovery status for post occurrence of Coronavirus disease (COVID-19) towards equity market namely Kuala Lumpur Composite Index (KLCI) and currency exchange rate for Malaysia Ringgit.

## **2. Literature review**

COVID-19 outbreak erupted in December 2019 in the city of Wuhan, Hubei province, China and spread rapidly via human-to-human transmission (Wen, et al., 2020). Wuhan is a major transportation hub in China, located on the crossroads between the railway line linking Beijing and Guangzhou and the Yangtze River linking Chongqing and Shanghai (Wen, *et al.*, 2020; Zhong *et al.*, 2020). COVID-19 was spread very fast and until now, no vaccine is yet available. Apart from many steps taken to control the COVID-19, under non-pharmaceutical interventions, lockdown had been a primary strategy adopted by most of the countries (Kashyap and Raghuvanshi, 2020).

The main objective of the lockdown is to reduce the number of infected and slow down the rate of spread of Covid-19 among people. Zhang, et al., (2020) investigate the potential economic cost of the COVID-19 pandemic on China's macro economy and agri-food system and provide policy recommendations to stimulate economic growth and agri-food system development. The

found that the macroeconomy and agri-food systems are hit significantly by COVID-19. Besides the China, India also have a big impact of COVID-19. Sandeep Kumar, et al., (2020) mention that the impact of COVID-19 on the economy in India has been extremely disruptive. The findings reveal that the increasing number of lockdown days, monetary policy decisions and international travel restrictions severely affected the level of economic activities and the closing, opening, lowest and highest stock price of major stock market indices. In Malaysia country, COVID-19 give impact on the tourism industry. The Visit Malaysia 2020 campaign that aimed to attract 30 million tourist arrivals have also been cancelled due to COVID-19 crisis. This industry was contributed more than 50% of export trade-in service in Malaysia.

### 3. Research methodology

The aim of this study is to evaluate economic condition in Malaysia after the outbreak of COVID-19. This study selected Kuala Lumpur Composite Index (KLCI) as main indicators and supporting by Malaysian Ringgit currency exchange rate as second indicator. The data were retrieved from Bloomberg database in gaining all daily observation values. In this study, normality test and correlation testing were performed to develop robust and reliable conclusion about current progress of economic condition in Malaysia after outbreak of COVID-19.

Normality characteristics is one of the requirement to perform parametric statistical test. Therefore, normality checking for actual data is an important element in this study. The normality characteristic of real data distribution is shown in Equation (1).

$$f(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2} \dots\dots\dots (1)$$

The parameters in Equation (1) are described as follow:

$\mu$  : Mean of real data for x-variable.

$\sigma$  : Standard deviation for data distribution of x-variable.

Then, this study evaluated the association between indicators to analyze the economic situation in Malaysia. This paper using Pearson correlation for statistical method of correlation analysis between two variables. The value of Pearson correlation is between value of -1 and 1. Absolute zero value indicates no relationship. Meanwhile absolute value of 1 shows there is strong correlation among focus variables. The Pearson correlation was calculated using Equation (2).

$$\rho_{X,Y} = \frac{\text{cov}(X,Y)}{\sigma_X \sigma_Y} \dots\dots\dots (2)$$

The variables in Equation (2) are explained as below:

$\text{cov}(X,Y)$  : Covariance between x-variable and y-variable.

$\sigma_X$  : Standard deviation for data distribution of x-variable.

$\sigma_Y$  : Standard deviation for data distribution of y-variable.

The Pearson correlation can be re-arranged to use mean and expectation approach as shown in Equation (3).

$$\rho_{X,Y} = \frac{E[(X - \mu_X)(Y - \mu_Y)]}{\sigma_X \sigma_Y} \dots\dots\dots (3)$$

For the sample of Pearson correlation, calculation procedure follows Equation (4).

$$\tau_{xy} = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^n (x_i - \bar{x})^2} \sqrt{\sum_{i=1}^n (y_i - \bar{y})^2}} \dots\dots\dots (4)$$

$n$  : sample size,

$x_i$  : x-variable at observation period  $i$ ,  $\bar{x}$  : Mean for x-variable,

$y_i$  : y-variable at observation period  $i$ ,  $\bar{y}$  : Mean for y-variable.

## 4. Result

The main objective of this study is to analyze economic condition in Malaysia after post COVID-19 in Malaysia. There are two main indicators namely Kuala Lumpur Composite Index (KLCI) and Malaysian ringgit currency exchange rate. Figure 1 shows the behavior of index value for KLCI. The observation is using daily interval starting from 1<sup>st</sup> April 2020 until 30<sup>th</sup> July 2020. There are 76 daily observations involved in this study. The value of KLCI on 1<sup>st</sup> April 2020 is 1322.66 point. The last observation on 30<sup>th</sup> July 2020 shows KLCI value is 1603.75 point. The data shows there is significant improvements of KLCI point that shows good progress of economic situation in Malaysia.

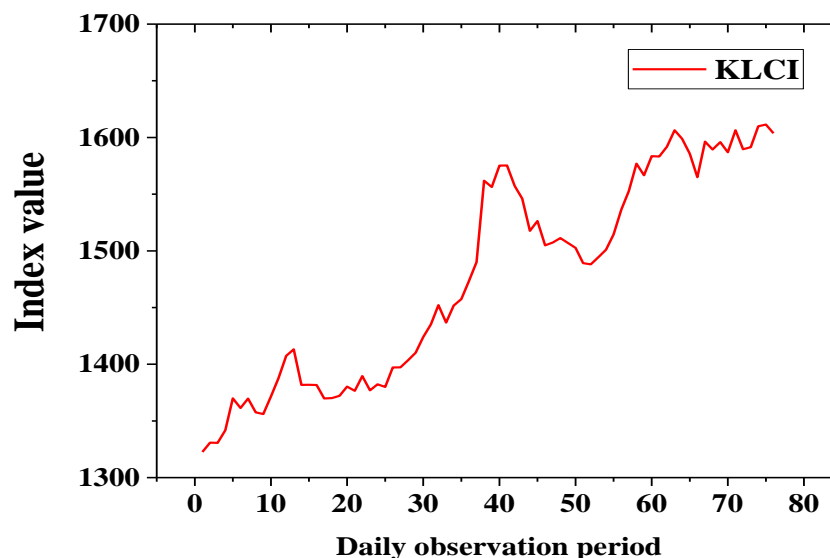


Figure 1: KLCI value on post-COVID19

Next, in analyzing the statistical method for KLCI behavior, this study calculated rate of changes for KLCI point using Equation (5).

$$\text{Changes of KLCI} = \left( \frac{P_{i+1} - P_i}{P_i} \right) \times 100\% \dots\dots\dots (5)$$

Where,

$P_{i+1}$  ; Value of KLCI on daily observation period  $i + 1$  .

$P_i$  ; Value of KLCI on daily observation period  $i$  .

Figure 2 shows the changes rate of KLCI on post COVID-19 period. The data were examined thoroughly with outlier detection process. The maximum value of KLCI change is on 7<sup>th</sup> April 2020 (5<sup>th</sup> observation) with value of 2.104 percentages. The minimum value of KLCI change is on 21<sup>st</sup> April 2020 (14<sup>th</sup> observation) with value of -2.221 percentages.

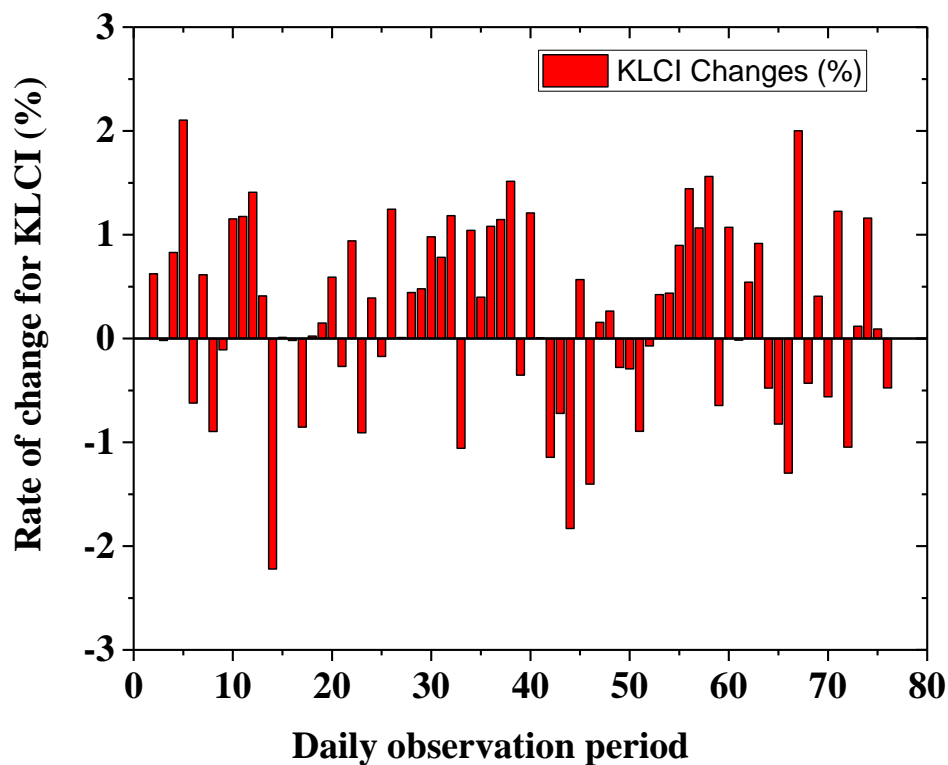


Figure 2: Changes of KLCI value on post-COVID19

Next, this study performed normality statistical test to determine the distribution of data for KLCI changes. The Shapiro-Wilk normality test was selected as statistical test to evaluate data distribution for KLCI changes.

The normality statistical test was performed using Shapiro-Wilk approach. Table 1 shows descriptive statistics for data of KLCI changes. The mean value is 0.218 percentages, median value is 0.264 and variance is 0.805. Table 2 shows Shapiro Wilk test for normality. The p-value is 0.539 that larger than chosen alpha of 0.05. Therefore, this study failed to reject null hypothesis. The distribution of KLCI changes data follows normal distribution. Figure 3 and 4 shows the distribution follow normal distribution from graphical testing.

Table 1: Descriptive statistics for data of KLCI changes

		Statistic	Std. Error
KLCI	Mean	.2185214	.10359400
	Median	.2640553	
	Variance	.805	
	Std. Deviation	.89715034	
	Skewness	-.305	.277
	Kurtosis	-.231	.548

Table 2: Test of Normality

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
KLCI	.069	75	.200 <sup>*</sup>	.985	75	.539

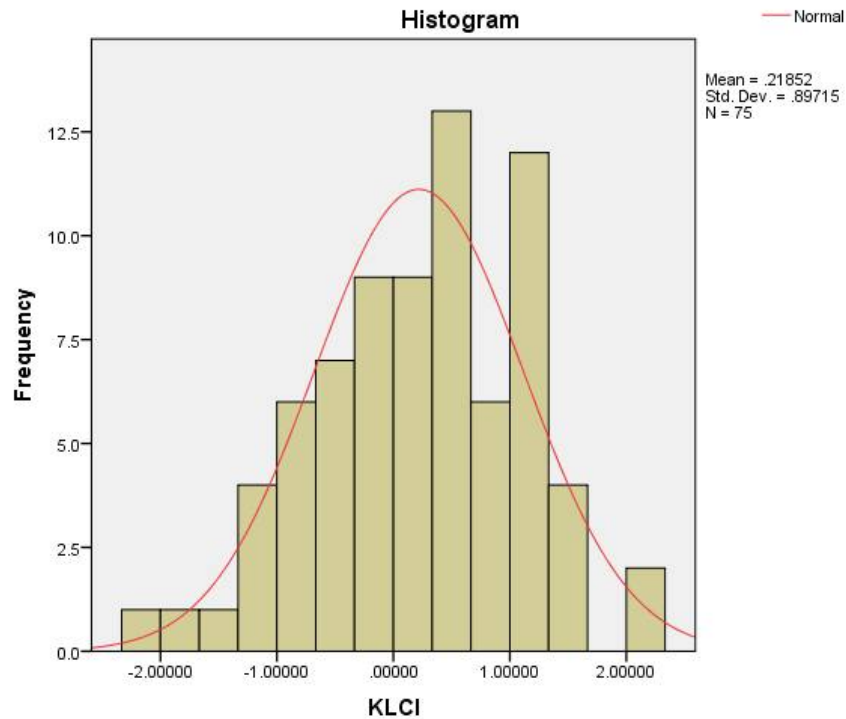


Figure 3: Histogram for KLCI changes

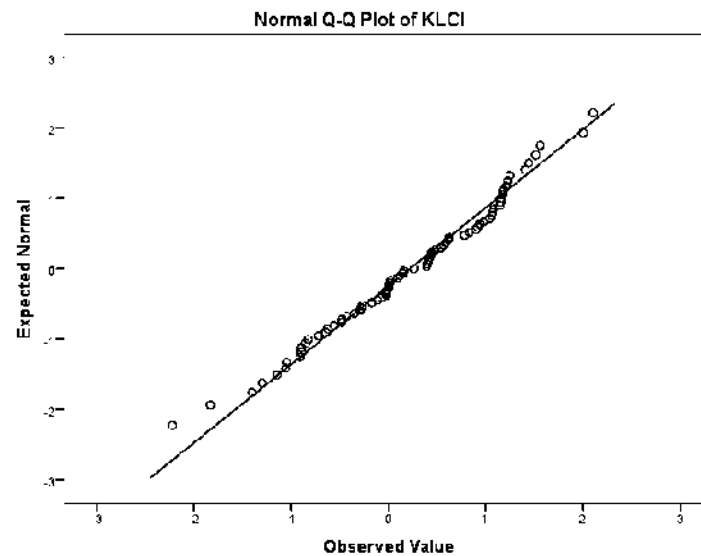


Figure 4: Normal Q-Q plot for data KLCI changes

Then, this study also analysed distribution data for changes in currency exchange rate. Figure 5 shows the dynamic movement of currency exchange rate for Malaysian Ringgit (MYR). The observation is using daily interval starting from 1<sup>st</sup> April 2020 until 30<sup>th</sup> July 2020. There are 76 daily observations involved in this study. The value of currency exchange rate on 1<sup>st</sup> April 2020

is 0.299 USD for each MYR. The last observation on 30<sup>th</sup> July 2020 shows currency exchange rate is 0.236 USD for each MYR. The data shows there is significant improvements of currency exchange rate that proved good progress of economic situation in Malaysia.

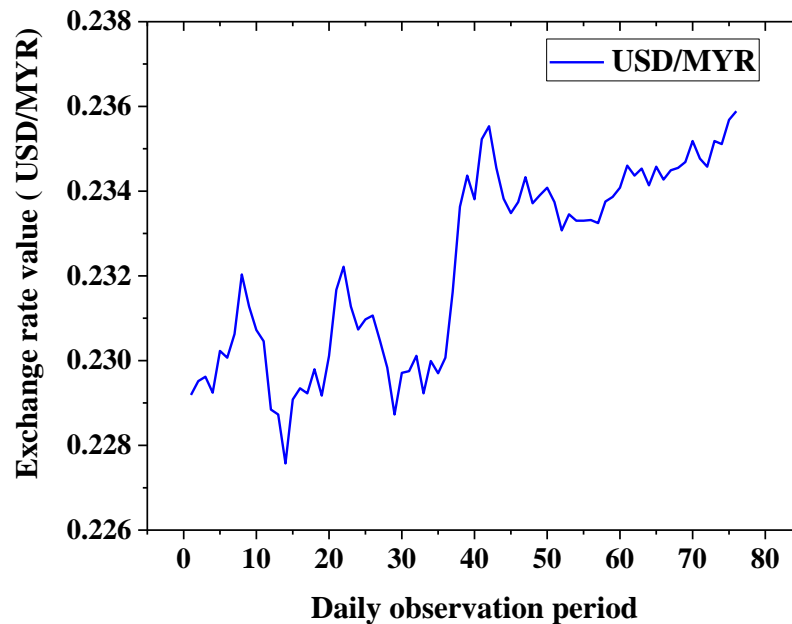


Figure 5: Dynamic behavior of currency exchange rate of Malaysian ringgit

Furthermore, in analyzing the statistical method for currency exchange rate for Malaysia Ringgit, this study calculated rate of changes for currency exchange using Equation (6).

$$\text{Changes of exchange rate} = \left( \frac{E_{i+1} - E_i}{E_i} \right) \times 100\% \dots\dots\dots (6)$$

Where,

$E_{i+1}$  : Value of MYR currency exchange rate on daily observation period  $i + 1$ .

$E_i$  : Value of MYR currency exchange rate on daily observation period  $i$ .

Figure 6 shows the changes of MYR currency exchange rate on post COVID-19 period. The data were examined thoroughly with outlier detection process. The maximum value of changes for MYR currency exchange rate is on 4<sup>th</sup> June 2020 (38<sup>th</sup> observation) with value of 0.871 percentages. The minimum value of changes for MYR currency exchange rate is on 17<sup>th</sup> April 2020 (12<sup>th</sup> observation) with value of -0.700 percentages.



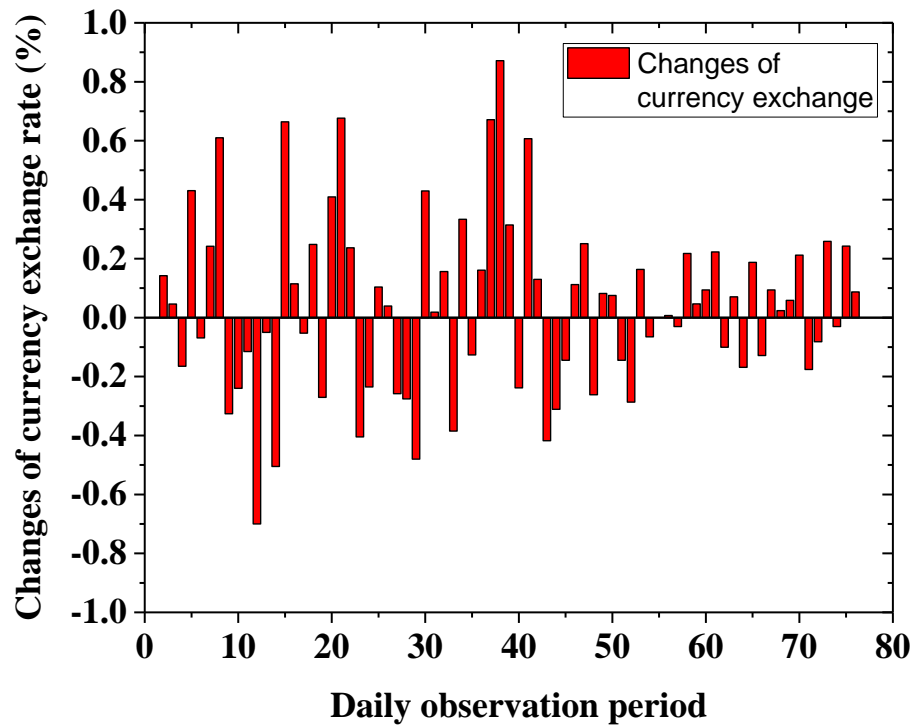


Figure 6: Changes of MYR currency exchange rate on post-COVID19

Then, this study performed normality statistical test to determine the distribution of data for MYR currency exchange rate changes. The Shapiro-Wilk normality test was selected as statistical test to evaluate data distribution for MYR currency exchange rate changes.

The normality statistical test was performed using Shapiro-Wilk approach. Table 3 shows descriptive statistics for data of changes for MYR currency exchange rate. The mean value is 0.039 percentages, median value is 0.046 and variance is 0.09. Table 4 shows Shapiro Wilk test for normality for actual data distribution. The p-value is 0.404 that larger than chosen alpha of 0.05. Therefore, this study failed to reject null hypothesis. The distribution of MYR currency exchange rate changes data follows normal distribution. Figure 3 and 4 shows the distribution follow normal distribution from graphical testing.

Table 3. Normality test for changes of MYR exchange rate data

		Statistic	Std. Error
MYR	Mean	.0388596	.03458794
	Median	.0459242	
	Variance	.090	
	Std. Deviation	.29954037	
	Minimum	-.70026	
	Maximum	.87145	
	Skewness	.349	.277
	Kurtosis	.416	.548

Table 4. Tests of normality for actual data of MYR exchange rate changes

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
MYR	.085	75	.200 <sup>*</sup>	.983	75	.404

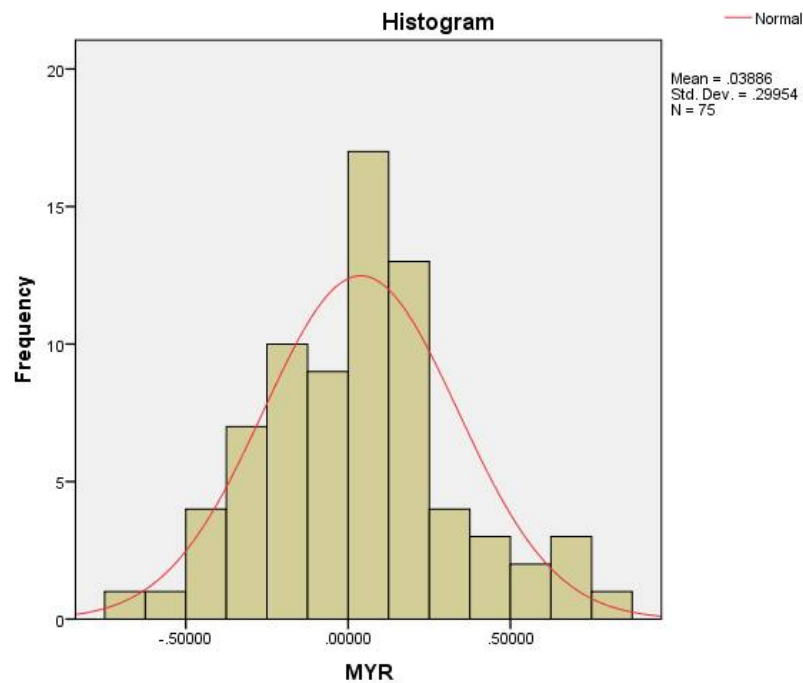


Figure 7. Histogram of changes for MYR currency exchange rate

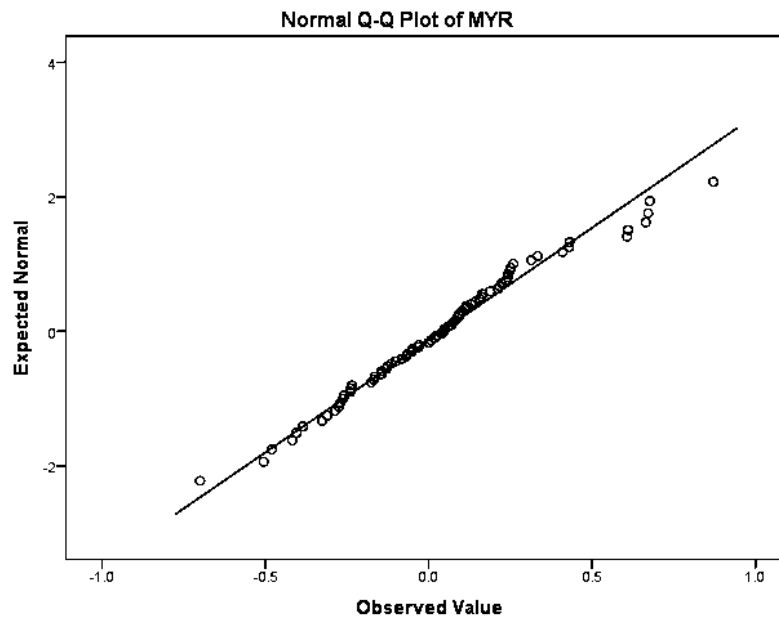


Figure 8. Normal Q-Q plot of changes for MYR currency exchange rate

Next, this study evaluated the correlation strength between two indicators namely changes in KLCI and MYR currency exchange rate. Figure 9 shows distribution between these two variables. The blue line shows the forecasting line that indicates relationship between two indicators.

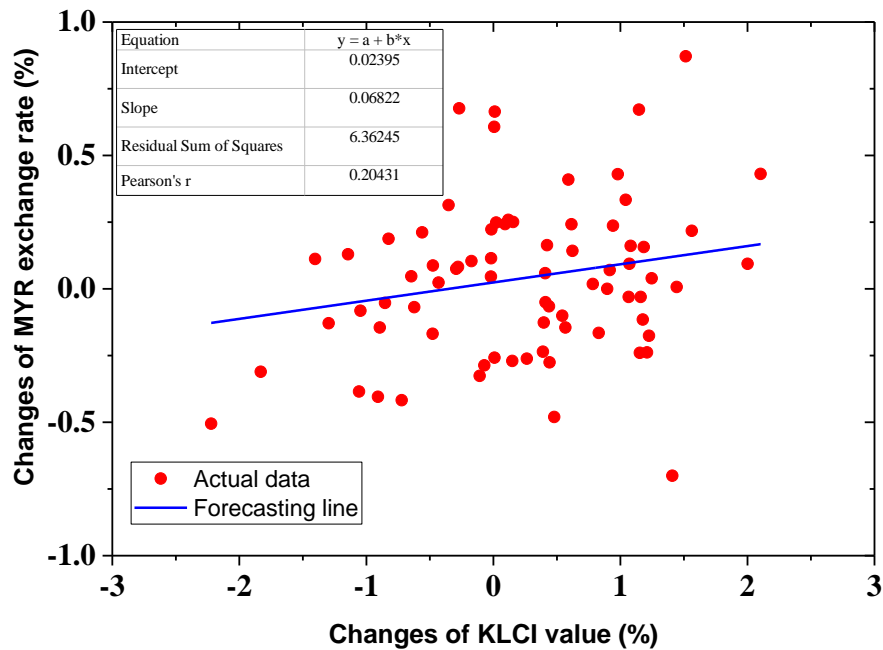


Figure 8. Scatter plot for correlation between two variables

Furthermore, Table 5 shows the Pearson correlation coefficient between changes of KLCI value and MYR currency exchange rate. The value of correlation coefficient is 0.204 that indicates there is positive relationship between two variables. The significant value is 0.079 that is less than chosen alpha 0.1. Therefore, there is significant correlation between changes in KLCI and MYR exchange rate. This finding shows Malaysia economic indicates positive recovery after outbreak of COVID-19 in year of 2020.

Table 5. Pearson correlation analysis between two variables

		KLCI	MYR
KLCI	Pearson Correlation	1	.204
	Sig. (2-tailed)		.079
	N	75	75

## 5. Conclusion

The purpose of this study is to analyze the effect of COVID-19 to economy and their current status towards Malaysian economy. This study is important to give information to public in increasing awareness about Malaysian economy. The main findings from this analysis are:

- (i) There are two main indicators namely Kuala Lumpur Composite Index (KLCI) and Malaysian ringgit currency exchange rate. The observations in this study is using daily interval starting from 1<sup>st</sup> April 2020 until 30<sup>th</sup> July 2020. There are 76 daily observations involved in this study.
- (ii) The data shows there is significant improvements of currency exchange rate that proved good progress of economic situation in Malaysia. In the same time, increment in KLCI shows good progress of economic situation in Malaysia.
- (iii) The Shapiro Wilk test implemented for normality checking with p-value is 0.539 that larger than chosen alpha of 0.05. The distribution of KLCI changes data follows normal distribution. Next, the p-value of Shapiro Wilk normality test is 0.404 that larger than chosen alpha of 0.05. The distribution of MYR currency exchange rate changes data follows normal distribution.
- (iv) The value of correlation coefficient is 0.204 that indicates there is positive relationship between two variables. The significant value is 0.079 that is less than chosen alpha 0.1. Therefore, there is significant correlation between changes in KLCI and MYR exchange rate. This finding shows Malaysia economic indicates positive recovery after outbreak of COVID-19 in year of 2020.

This study give contribution towards body of knowledge in economic of Malaysia. In addition, the findings help investors to have confident to invest in stock market in Malaysia.

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